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The use of vertical and horizontal surface displacements at EPOS GNSS stations in Greenland to study ice sheet mass balance

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The European Plate Observing System (EPOS) includes e.g. seismic and geodetic permanent national monitoring networks on a European scale. The main purpose is to create data platforms for monitoring and study geophysics processes like earthquakes, volcanoes, surface dynamics and tectonics. Here we present data from arctic GNSS stations included in the EPOS network. The arctic EPOS GNSS network consists of 16 continuous GPS stations spread across Greenland. This network is able to map the velocity fields associated with, plate motion, postglacial rebound and improve our understanding of tectonic processes and present-day ice mass changes in Greenland, allowing scientists to quickly detect and analyze any abrupt changes in the rate of ice loss in this region. Recent analyses of the EPOS-GNSS data and GNET data (Greenland GPS Network) show that the entire network is uplifting in response to past and present-day changes in ice mass. Superimposed on longer-term trends, an anomalous 'pulse' of uplift accumulated at many GNSS stations during an approximate six-month period in 2010 and 2012. This anomalous uplift is spatially correlated with the 2010 melting day anomaly (Bevis et al.,2012) and show the capability of the EPOS-GNSS station to monitor present changes in the climate.